

Application No. 09/987,674  
Amendment dated December 16, 2005  
Response to Office Action dated June 16, 2005

#### REMARKS

Reconsideration and allowance of the above-identified application are respectfully requested. Upon entry of this Amendment, claims 1-26 will remain pending.

Claims 1, 3, 6, 7, 10, 12, 14, 16, 19, 20, 23 and 25 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,680,240 to Glynn. Also, claims 2 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Glynn patent in view of U.S. Patent No. 5,037,173 to Sampsell et al. In addition, claims 4, 5, 11, 13, 17, 18, 24 and 26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Glynn patent in further view of U.S. Patent No. 4,633,428 to Bryon. Furthermore, claims 8, 9, 21 and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Glynn patent in view of U.S. Patent No. 5,512,907 to Riza. These rejections are respectfully traversed.

Specifically, Applicants respectfully submit that the cited patents, viewed individually or in combination, fail to teach or suggest a system or method for *testing* a wireless network of transceivers through the use of an optical matrix-vector multiplier (MVM) arranged as specifically recited in the claims of the present application. Rather, the Glynn patent teaches a high capacity communications satellite employing a spatial light modulator (SLM) array for use in communication, not testing or simulation. The other three cited patents fail to make up for the deficiencies in the teachings of the Glynn patent.

The rejections will now be addressed in more detail.

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As described throughout the present application, the embodiments of the present invention provide a system and method for providing simulated hardware-in-the-loop testing of a wireless communications network. The system and method employ an optical matrix-vector multiplier (MVM) for performing optical signal processing to simulate radio frequency (RF) signal propagation characteristics in a mobile wireless communications.

As indicated above, independent claim 1 defines system *for testing a wireless network of transceivers*. The system comprises an optical modulator, an optical matrix-vector multiplier (MVM), and a detector device. The optical modulator modulates optical energy with signal energy propagating from a first group of the transceivers of the network to form a vector of optical signals. The optical MVM comprises a matrix of *optical channel weights which are modifiable in accordance with desired parameters to simulate at least one parameter of the wireless network*. Hence, when the optical MVM receives the vector of optical signals, the optical MVM outputs signals based on the received vector of optical signals and the optical channel weights. The detector device detects the output signals and to provide the output signals as an output vector of signals to a second group of transceivers of the network. Independent method claim 14 defines similar features in method step format. Applicant notes that minor editorial amendments are being made to claims 1 and 14 as indicated above.

Concerning the rejection based on the Glynn patent alone, as discussed briefly above, Applicants respectfully submit that the Glynn patent teaches a high capacity communications satellite employing a spatial light modulator (SLM) array for use in communication. Applicants

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submit that the Glynn patent in no way relates to the testing or simulation of a wireless network of transceivers. Applicants further note that as would be appreciated by one skilled in the art, a SLM array as employed in the Glynn system is not an optical MVM that comprises a matrix of *optical channel weights which are modifiable in accordance with desired parameters to simulate at least one parameter of the wireless network*. Granted, as discussed throughout the present application, an SLM array can be configured for use as an optical MVM. However, Applicants submits that in no way does the Glynn patent teach or suggest this configuration and especially, the specific configuration having modifiable optical channel weights as claimed.

For all these reasons, Applicants submit that the Glynn patent fails to anticipate even independent claims 1 and 14.

Concerning the rejection based on the Glynn and Sampsell patents, Applicant respectfully submits that the Sampsell patent teaches an optical interconnection network employing, among other things, an amplifier as shown in Figure 2. The Examiner contends that this amplifier feature could have been employed in the Glynn system to achieve the embodiments of the present invention as recited in dependent claims 2 and 15.

However, Applicant respectfully submits that the network taught by the Sampsell patent is unlike the communication satellite as taught by the Glynn patent and therefore, one skilled in the art would not have been motivated to modify the Glynn system in accordance with the teachings of the Sampsell patent. Furthermore, Applicant respectfully submits that the Sampsell patent fails to teach or suggest a testing or simulation system employing, in particular, an optical MVM as recited in

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independent claims 1 and 14. Accordingly, Applicant respectfully submits that the teachings of the Sampsell patent fail to make up for the deficiencies in the teachings of the Glynn patent to have rendered obvious the embodiments of the present invention even as recited in independent claims 1 and 14. Hence, all claims should be allowable over these references.

Concerning the rejection based on the Glynn and Byron patents, Applicant respectfully submits that the Byron patent teaches an optical matrix-vector multiplier. The Examiner contends that this feature could have been employed in the Glynn system to achieve the embodiments of the present invention as recited in dependent claims 4, 5, 11, 13, 17, 18, 24 and 26.

However, Applicant respectfully submits that the apparatus taught by the Byron patent is unlike the communication satellite as taught by the Glynn patent and therefore, one skilled in the art would not have been motivated to modify the Glynn system in accordance with the teachings of the Byron patent. Furthermore, Applicant respectfully submits that the Byron patent fails to teach or suggest a testing or simulation system employing, in particular, an optical MVM as recited in independent claims 1 and 14, that includes *optical channel weights which are modifiable in accordance with desired parameters to simulate at least one parameter of the wireless network*. Applicant notes, in addition, that dependent claims 4 and 17 of the present application explicitly recite that the optical modulator *enables full duplex simulation of the network*. Applicant respectfully submits that the Glynn and Byron patents fail to teach or suggest this feature.

Accordingly, Applicant respectfully submits that the teachings of the Byron patent fail to make up for the deficiencies in the teachings of the Glynn patent to have rendered obvious the

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embodiments of the present invention even as recited in independent claims 1 and 14. Hence, all claims should be allowable over these references.


Concerning the rejection based on the Glynn and Riza patents, Applicant respectfully submits that the Riza patent teaches an optical beamsteering system. The Examiner contends that this feature could have been employed in the Glynn system to achieve the embodiments of the present invention as recited in dependent claims 8, 9, 21 and 22.

However, Applicant respectfully submits that the system taught by the Riza patent is unlike the communication satellite as taught by the Glynn patent and therefore, one skilled in the art would not have been motivated to modify the Glynn system in accordance with the teachings of the Riza patent. Furthermore, Applicant respectfully submits that the Riza patent fails to teach or suggest a testing or simulation system employing, in particular, an optical MVM as recited in independent claims 1 and 14. Accordingly, Applicant respectfully submits that the teachings of the Riza patent fail to make up for the deficiencies in the teachings of the Glynn patent to have rendered obvious the embodiments of the present invention even as recited in independent claims 1 and 14. Hence, all claims should be allowable over these references.

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In view of the above, it is believed that the subject application is in condition for allowance and notice to this effect is respectfully requested. The Examiner is invited to contact the undersigned with any questions at the telephone number indicated below.

Respectfully submitted,

  
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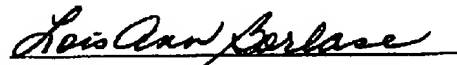
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Dated: December 16, 2005

#### CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this Amendment (along with any documents referred to as attached or enclosed) is being transmitted by facsimile to the United States Patent and Trademark Office, Attention: Examiner Hanh PHAN, Art Unit 2638, Facsimile Number 571-273-8300, on the date indicated.

Lois Ann Borlase  
Printed Name

  
Signature

Date: 12/16/05